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FIGURES

FIG. 1

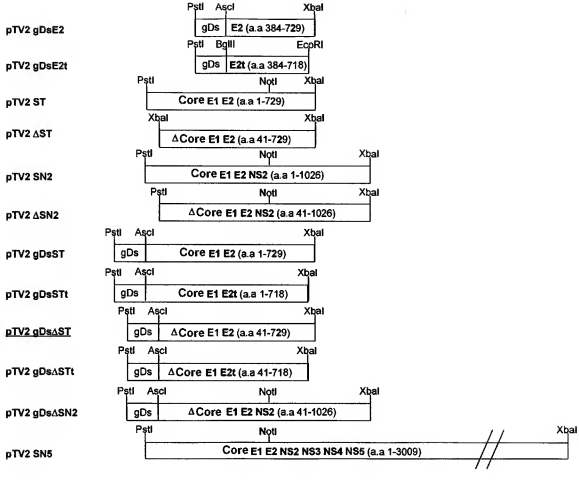

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FIG. 2

HC102

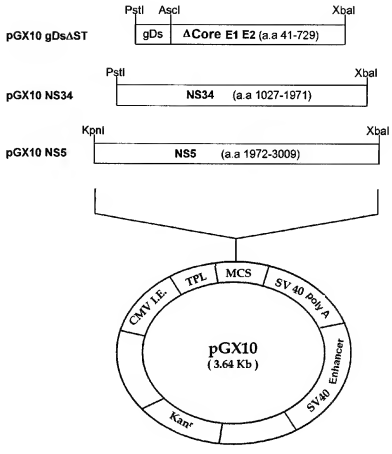

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FIG. 3

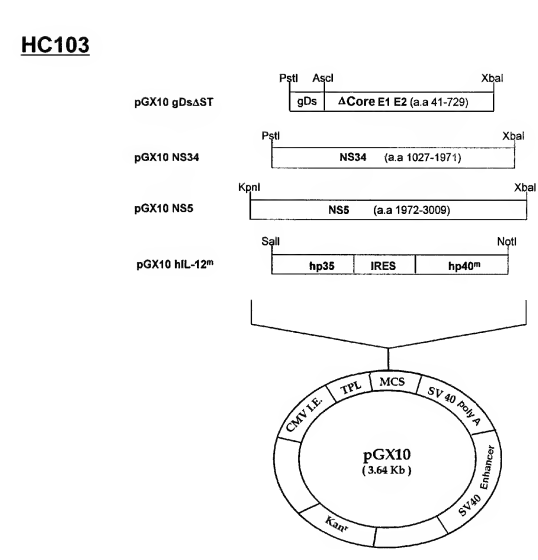
HC103
pGX10 gDsΔST
PstI
AscI
XbaI
gDs
ΔCore E1 E2 (a.a 41-729)
pGX10 NS34
PstI
XbaI
NS34 (a.a 1027-1971)
pGX10 NS5
KpnI
XbaI
NS5 (a.a 1972-3009)
pGX10 hIL-12m
SalI
NotI
hp35
IRES
hp40m
MCS
TPL
CMV I.E.
SV 40 Poly A
pGX10
(3.64 Kb)
SV40 Enhancer
Kanr

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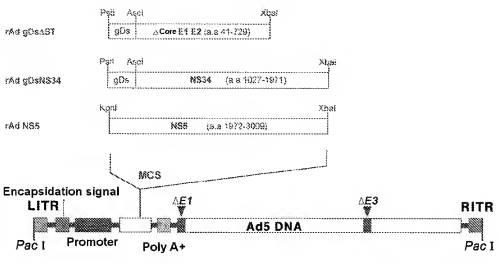
FIG. 4



rAd HC102

FIG. 5

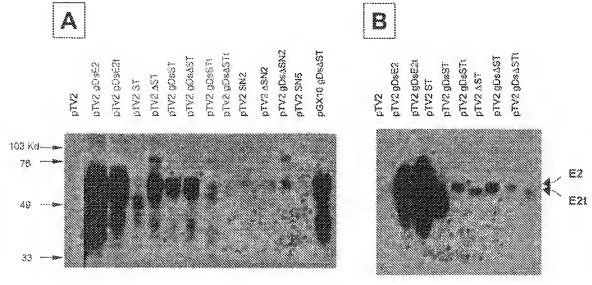


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FIG. 6

COS-7

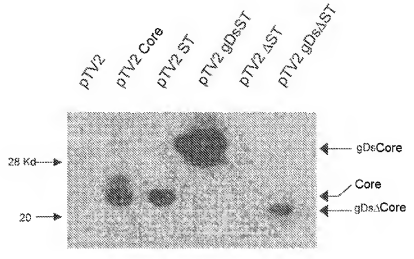

FIG. 7

COS-7

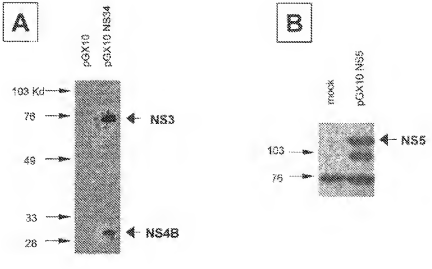

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FIG. 8

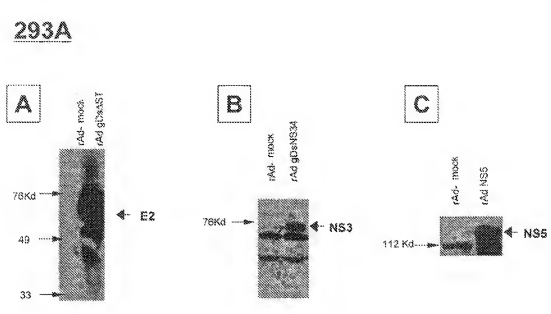
293A
A
rAd- mock
rAd gC×ΔST
78Kd
49
33
E2
B
rAd- mock
rAd gC×NS34
78Kd
NS3
C
rAd- mock
rAd NS5
112 Kd
NS5

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FIG. 9

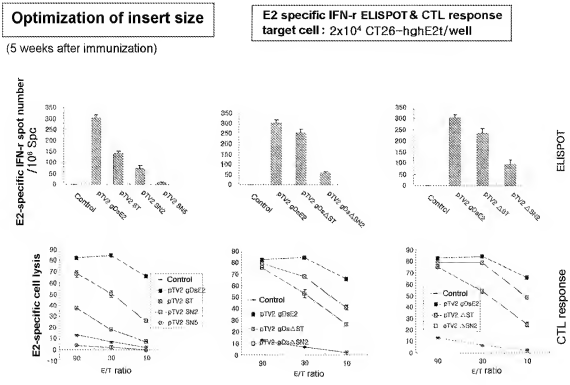

FIG. 10

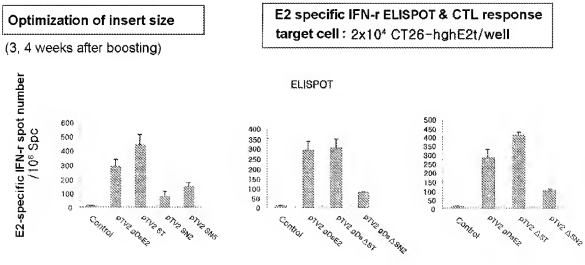

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FIG. 11

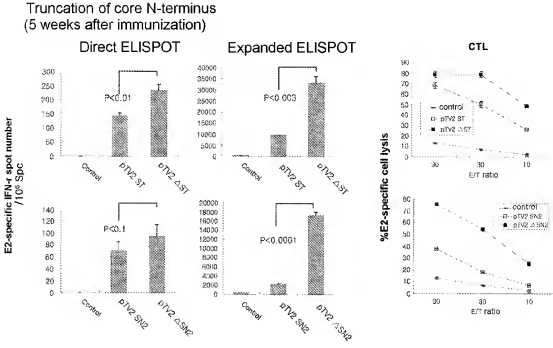
Truncation of core N-terminus
(5 weeks after immunization)
Direct ELISPOT
Expanded ELISPOT
CTL
E2-specific IFN-γ spot number / 10^5 Spc
P<0.01
P<0.003
P<0.1
P<0.0001
Control
pTV2-ST
pTV2-ΔST
pTV2-SN2
pTV2-ΔSN2
%E2-specific cell lysis
control
E/T ratio

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FIG. 12

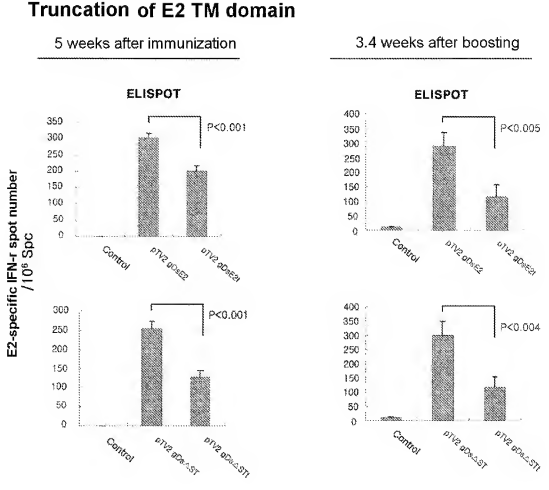
Truncation of E2 TM domain
5 weeks after immunization
3.4 weeks after boosting
ELISPOT
ELISPOT
E2-specific IFN-r spot number /10^6 Spc
P<0.001
P<0.005
P<0.001
P<0.004
Control
pTV2.gDsE2
pTV2.gDsE2t
pTV2.gDsE2-ST
pTV2.gDsE2t-ST1

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FIG. 13

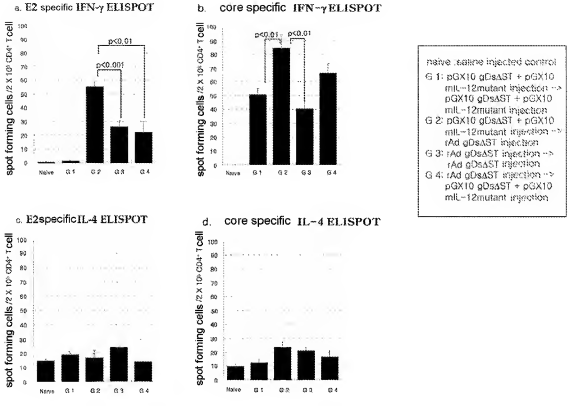
a. E2 specific IFN-γ ELISPOT
b. core specific IFN-γ ELISPOT
spot forming cells /2 X 10⁵ CD4⁺ T cell
p<0.01
p<0.001
Naive
G 1
G 2
G 3
G 4
naive : saline injected control
G 1: pGX10 gDsΔST + pGX10 mIL-12mutant injection --> pGX10 gDsΔST + pGX10 mIL-12mutant injection
G 2: pGX10 gDsΔST + pGX10 mIL-12mutant injection --> rAd gDsΔST injection
G 3: rAd gDsΔST injection --> rAd gDsΔST injection
G 4: rAd gDsΔST injection --> pGX10 gDsΔST + pGX10 mIL-12mutant injection
c. E2specificIL-4 ELISPOT
d. core specific IL-4 ELISPOT

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FIG. 14

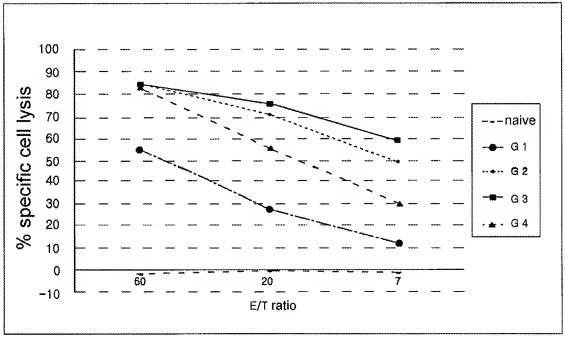
% specific cell lysis
100
90
80
70
60
50
40
30
20
10
0
-10
60
20
7
E/T ratio
naive
G 1
G 2
G 3
G 4

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FIG. 15

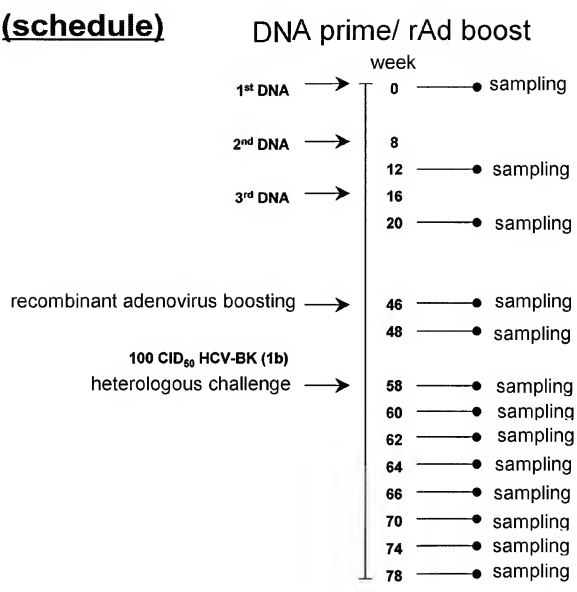
(schedule)
DNA prime/ rAd boost
week
1st DNA
2nd DNA
3rd DNA
recombinant adenovirus boosting
100 CID50 HCV-BK (1b)
heterologous challenge
0 sampling
8
12 sampling
16
20 sampling
46 sampling
48 sampling
58 sampling
60 sampling
62 sampling
64 sampling
66 sampling
70 sampling
74 sampling
78 sampling

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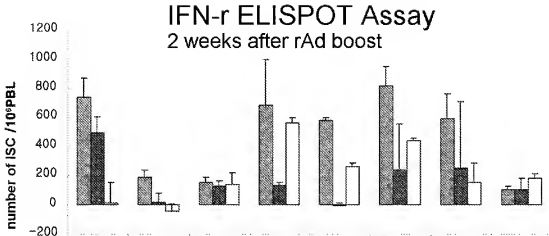
FIG. 16



	#404	#406	#376	#393	#400	#381	#397	#402
	naive		HC102			HC103		
C/E2	738	187	155	682	577	814	593	103
NS3	492	18	126	135	-7	237	252	105
NS5A	12	-43	141	561	261	437	153	182

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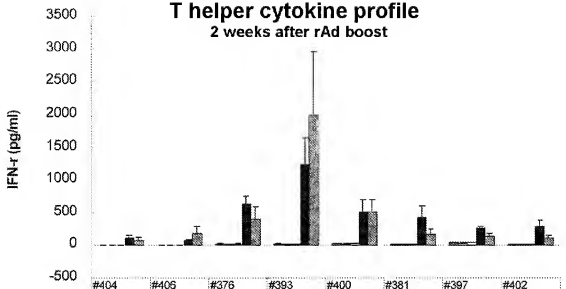
FIG. 17



	#404	#405	#376	#393	#400	#381	#397	#402
	naive			HC102			HC103	
media	2	9	21	21	30	19	43	20
SOD	-1	2	12	13	24	16	39	14
GST-core	2	11	22	12	29	21	43	19
GST-NS3	115	72	631	1237	515	434	260	286
NS5	78	182	402	1981	513	162	144	109
PHA	910	1668	3549	3216	1837	2427	2481	914

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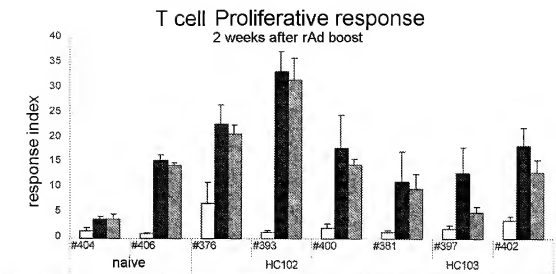
FIG. 18



	#404	#406	#376	#393	#400	#381	#397	#402
□GST-core	1.5	1.0	7.1	1.3	2.1	1.3	2.0	3.7
■GST-NS3	3.8	15.6	22.9	33.5	18.0	11.4	13.1	18.5
▨NS5	3.9	14.5	20.9	31.8	14.7	9.9	5.2	13.2
PHA	85.5	110.0	82.4	96.2	83.7	184.1	180.1	75.8

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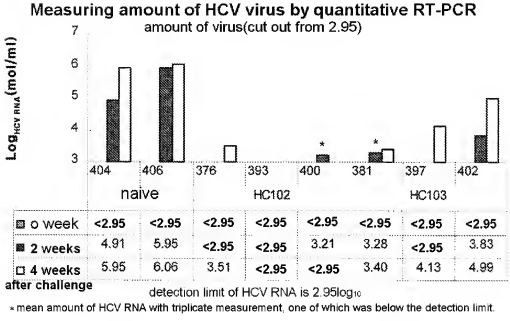
FIG. 19



after challenge	404	406	376	393	400	381	397	402
o week	<2.95	<2.95	<2.95	<2.95	<2.95	<2.95	<2.95	<2.95
2 weeks	4.91	5.95	<2.95	<2.95	3.21	3.28	<2.95	3.83
4 weeks	5.95	6.06	3.51	<2.95	<2.95	3.40	4.13	4.99

detection limit of HCV RNA is 2.95$\log_{10}$

* mean amount of HCV RNA with triplicate measurement, one of which was below the detection limit.

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FIG. 20a

Amino acid sequence of core peptide pool

Δcore (43-191)			
No	Name	Sequence	SEQ ID NO
#1	HCV43-52	RLGVRATRKT SERSQPRGRR	55
#2	HCV53-72	SERSQPRGRR QPIPKARQPE	56
#3	HCV63-82	QPIPKARQPE GRTWAQPGYP	57
#4	HCV73-92	GRTWAQPGYP WPLYGNEGLG	58
#5	HCV83-102	WPLYGNEGLG WAGWLLSPRG	59
#6	HCV93-112	WAGWLLSPRG SRPSWGPTDP	60
#7	HCV103-122	SRPSWGPTDP RRRSRNLGKV	61
#8	HCV113-132	RRRSRNLGKV IDTLTCGFAD	62
#9	HCV123-142	IDTLTCGFAD LMGYIPLVGA	63
#10	HCV133-152	LMGYIPLVGA PLGGVARALA	64
#11	HCV143-162	PLGGVARALA HGVRLLEDGV	65
#12	HCV153-172	HGVRLLEDGV NYATGNLPGC	66

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FIG. 20b

Amino acid sequence of E2t peptide pool

E2t (284-713)							
No	Name	Sequence	SEQ ID NO	No	Name	Sequence	SEQ ID NO
#13	HCV384-403	STRVTGGTEG RTTNRFVSIF	67	#29	HCV554-573	WMNSTGFTKT CGGPPCDIGG	83
#14	HCV404-423	ASGPSQKIQL VNNNGSWHIN	68	#30	HCV564-583	CGGPPCDIGG VGNNTLTCPT	84
#15	HCV414-433	VNNNGSWHIN RTALNCNDSL	69	#31	HCV574-593	VGNNTLTCPT DCFRKHPEAT	85
#16	HCV424-443	RTALNCNDSL SSGFIAALFY	70	#32	HCV584-603	DCFRKHPEAT YTKCGSGPWL	86
#17	HCV434-453	SSGFIAALFY THKFDSSGCP	71	#33	HCV594-613	YTKCGSGPWL TPRCMVDYPY	87
#18	HCV444-463	THKFDSSGCP ERMASCRPID	72	#34	HCV604-623	TPRCMVDYPY RLWHYPCTIN	88
#19	HCV454-473	ERMASCRPID KFAQGWGSIT	73	#35	HCV614-633	RLWHYPCTIN FTIFKVRMYV	89
#20	HCV464-483	KFAQGWGSIT YAESGGSDQR	74	#36	HCV624-643	FTIFKVRMYV GGVEHRLDAA	90
#21	HCV474-493	YAESGGSDQR FYCWHYAPRQ	75	#37	HCV634-653	GGVEHRLDAA CNWTRGERCD	91
#22	HCV484-503	FYCWHYAPRQ CGIVPASQVC	76	#38	HCV644-663	CNWTRGERCD LEDRDRSELS	92
#23	HCV494-513	CGIVPASQVC GPVYCFTPSP	77	#39	HCV654-673	LEDRDRSELS PLLLSTTEWQ	93
#24	HCV504-523	GPVYCFTPSP VVVGTTDRSG	78	#40	HCV664-683	PLLLSTTEWQ VLPCSFTTLP	94
#25	HCV514-533	VVVGTTDRSG APTYTWGENE	79	#41	HCV674-693	VLPCSFTTLP ALSTGLIHLH	95
#26	HCV524-543	APTYTWGENE TDVLLLNNTR	80	#42	HCV684-703	ALSTGLIHLH QNIVHAQHLH	96
#27	HCV534-553	TDVLLLNNTR PPQANWFGCT	81	#43	HCV694-713	QNIVHAQHLH GVGSAVVSIV	97
#28	HCV544-563	PPQANWFGCT WMNSTGFTKT	82				

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FIG. 20c

Amino acid sequence of NS3 protease peptide pool

NS3 protease (1029-1217)			
No	Name	Sequence	SEQ ID NO
#44	gHCV-1029	ITAYSQQTRGLLGCIITSLT	98
#45	gHCV-1039	LLGCIITSLTGRDKNQVEGE	99
#46	gHCV-1069	FLATCVNGAWTVFHGAGSK	100
#47	gHCV-1078	WTVFHGAGSKTLAGPKGPIT	101
#48	gHCV-1088	TLAGPKGPITQMYTNVDLDL	102
#49	gHCV-1098	QMYTNVDLDLVGWQAPPGSR	103
#50	gHCV-1108	VGWQAPPGSRPLTPCTCGSS	104
#51	gHCV-1118	PLTPCTCGSSDLYLVTRHAD	105
#52	gHCV-1128	DLYLVTRHADVIPVRRRGDS	106
#53	gHCV-1138	VIPVRRRGDSRGSLPCPRPV	107
#54	gHCV-1148	RGSLPCPRPVSYLKGSSGGP	108
#55	gHCV-1158	SYLKGSSGGPLLCPSGHAVG	109
#56	gHCV-1168	LLCPSGHAVGIFRAAVCTRG	110
#57	gHCV-1178	IFRAAVCTRGVAKAVDFIPV	111
#58	gHCV-1188	VAKAVDFIPVESMETTMRSP	112
#59	gHCV-1198	ESMETTMRSPVFTDNSTPPA	113

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FIG. 20d

Amino acid sequence of Helicase peptide pool

NS3 helicase (1208-1656)							
No	Name	Sequence	SEQ ID NO	No	Name	Sequence	SEQ ID NO
#60	HCV1208-1227	VFTDNSTPPA VPQTFQVAHL	114	#77	HCV1458-1477	TQTVDFSLDP TFTIDTTTVP	131
#61	HCV1218-1237	VPQTFQVAHL HAPTGSGKST	115	#78	HCV1468-1487	TFTIDTTTVP QDAVSRSQRR	132
#62	HCV1228-1247	HAPTGSGKST KVPAAYAAQG	116	#79	HCV1478-1497	QDAVSRSQRR GRTGRGRRGI	133
#63	HCV1238-1257	KVPAAYAAQG YKVLVLNPSV	117	#80	HCV1488-1507	GRTGRGRRGI YRFVTPGERP	134
#64	HCV1248-1267	YKVLVLNPSV AATLGFGVYM	118	#81	HCV1498-1517	YRFVTPGERP SGMFDSSVLC	135
#65	HCV1258-1277	AATLGFGVYM SKAHGIDPNI	119	#82	HCV1518-1537	ECYDAGCAWY ELTPAETSVR	136
#66	HCV1268-1287	SKAHGIDPNI RTGVRAITTG	120	#83	HCV1528-1547	ELTPAETSVR LRAYLNTPGL	137
#67	HCV1278-1297	RTGVRAITTG APITYSTYGK	121	#84	HCV1538-1557	LRAYLNTPGL PVCQDHLEFW	138
#68	HCV1318-1337	HSTDSTSILG IGTVLDQAET	122	#85	HCV1548-1567	PVCQDHLEFW ESVFTGLTHI	139
#69	HCV1328-1347	IGTVLDQAET AGARLVVLAT	123	#86	HCV1558-1577	ESVFTGLTHI DAHFLSQTKQ	140
#70	HCV1348-1367	ATPPGSVTVP HPNIEEVALS	124	#87	HCV1568-1587	DAHFLSQTKQ AGDNFPYLVA	141
#71	HCV1358-1377	HPNIEEVALS NTGEIPFYGK	125	#88	HCV1578-1597	AGDNFPYLVA YQATVCARAQ	142
#72	HCV1368-1387	NTGEIPFYGK AIPIEVIKGG	126	#89	HCV1588-1607	YQATVCARAQ APPPSWDQMW	143
#73	HCV1388-1407	RHLIPCHSKK KSDELAAKLS	127	#90	HCV1598-1617	APPPSWDQMW KCLTRLKPTL	144
#74	HCV1398-1417	KSDELAAKLS ALGLNAVAYY	128	#91	HCV1608-1627	KCLTRLKPTL HGPTPLLYRL	145
#75	HCV1408-1427	ALGLNAVAYY RGLDVSVIPT	129	#92	HCV1618-1637	HGPTPLLYRL GAVQNEVTLT	146
#76	HCV1418-1437	RGLDVSVIPT SGDVVVVATD	130	#93	HCV1628-1647	GAVQNEVTLT HPVTKFIMAC	147

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FIG. 20e

Amino acid sequence of NS5A peptide pool

NS5A (1972-2411)							
No	Name	Sequence	SEQ ID NO	No	Name	Sequence	SEQ ID NO
#94	gHCV-1972	SGSWLRDVWDWICTVLTDFK	148	#113	gHCV-2192	GSPPSLASSSASQLSAPSLK	167
#95	gHCV-1982	WICTVLTDFKTWLQSKLLPR	149	#114	gHCV-2202	ASQLSAPSLKATCTIHHDSP	168
#96	gHCV-1992	TWLQSKLLPRLPGVPFFSCQ	150	#115	gHCV-2212	ATCTIHHDSPDADLIEANLL	169
#97	gHCV-2002	LPGVPFFSCQRGYKGVWRGE	151	#116	gHCV-2222	DADLIEANLLWRQEMGGNIT	170
#98	gHCV-2012	RGYKGVWRGEGIMQTTCPCG	152	#117	gHCV-2232	WRQEMGGNITRVESENKVVI	171
#99	gHCV-2022	GIMQTTCPCGAQIAGHVKNG	153	#118	gHCV-2242	RVESENKVVILDSFEPIRAE	172
#100	gHCV-2042	SMRIVGPRTCSNTWHGTFPI	154	#119	gHCV-2252	LDSFEPIRAEEDEREVSVPA	173
#101	gHCV-2052	SNTWHGTFPINAYTTGPCSP	155	#120	gHCV-2262	EDEREVSVPAEILRRSRKFP	174
#102	gHCV-2062	NAYTTGPCSPSPAPNYSRAL	156	#121	gHCV-2272	EILRRSRKFPAAMPIWARPD	175
#103	gHCV-2072	SPAPNYSRALWRVAAEEYVE	157	#122	gHCV-2292	YNPPLLESWKDPDYVPPVVH	176
#104	gHCV-2082	WRVAAEEYVEVTRVGDFHYV	158	#123	gHCV-2302	DPDYVPPVVHGCPLPPTKAA	177
#105	gHCV-2092	VTRVGDFHYVTGVTTDNVKC	159	#124	gHCV-2322	PIPPPRRKRTIVLTESTVSS	178
#106	gHCV-2102	TGVTTDNVKCPCQVPAPEFF	160	#125	gHCV-2332	IVLTESTVSSALAELATKTF	179
#107	gHCV-2122	TELDGVRLHRYAPACKPLLR	161	#126	gHCV-2342	ALAELATKTFGGSGSWAADS	180
#108	gHCV-2132	YAPACKPLLRDEVSFQVGLN	162	#127	gHCV-2352	GGSGSWAADSGTATAPPDQT	181
#109	gHCV-2152	QYLVGSQLPCEPEPDVAVLT	163	#128	gHCV-2372	SDDGDKESDVESYSSMPPLE	182
#110	gHCV-2162	EPEPDVAVLTSMLTDPSHIT	164	#129	gHCV-2382	ESYSSMPPLEGEPGDPDLSD	183
#111	gHCV-2172	SMLTDPSHITAETAKRRLAR	165	#130	gHCV-2392	GEPGDPDLSDGSWSTVSEEA	184
#112	gHCV-2182	AETAKRRLARGSPPSLASSS	166				